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June 30, 2004

Hon. Edward M. Chen
United States Magistrate Judge
450 Golden Gate Ave.
San Francisco, CA 94102

Re: *Synopsys, Inc. v. Ricoh Company, Ltd.*
Case No. C03-02289 MJJ (EMC)
Ricoh Company, Ltd. v. Aeroflex, Inc., et al.
Case No. C03-04669 MJJ (EMC)

Report of Synopsys and the Customer Defendants (Aeroflex et al.) Pursuant to the Court's Order of May 3, 2004

Dear Magistrate Judge Chen:

This letter is sent pursuant to the Court's order of May 3, regarding the subject matter of a possible deposition of Dr. Thomas. Although the Court's order required the parties to prepare a joint report, Ricoh's counsel sent an e-mail received at 12:55 PM today indicating that they would not participate in a joint submission.[1] As a result, this letter presents only the report of Synopsys and the customer defendants named in the *Ricoh v. Aeroflex* litigation.

RESULTS OF MEET AND CONFER

On June 11, Synopsys and the customer defendants presented Ricoh with a ten-page document identifying in detail the particular questions that Synopsys wished to put to Dr. Thomas. Those questions were drafted to focus on purely historical matters, and in particular on: a) what Dr. Thomas did or witnessed with respect to prior art synthesis systems, and b) the basis for statements made in technical articles authored by Dr. Thomas. Synopsys and the defendants asked only about Dr. Thomas' direct knowledge of prior art disclosures in order to ensure that the inquiry was "limited to prior art and not an evaluation (comparative or otherwise) of the patents in dispute," and that the resultant risk of breaching any privilege by asking these questions would be minimal. *See* Order of May 3, at p.2 ll.21-23. A copy of the questions presented by Synopsys and the customer defendants on June 11 is attached as an exhibit to this letter.

[1] The only explanation provided was that it would require too much effort for Ricoh to conform its filing to the "format" of this document within the time available, and that Ricoh objected to the presentation of facts in this letter. Why Ricoh could not incorporate its own statement of underlying facts in a joint report was not explained.

On June 23, the parties conferred by telephone regarding the best way to proceed. Synopsys and the customer defendants noted that many, if not all, of the questions did not raise any risk of the disclosure of confidential information. They proposed, therefore, that the parties come to some joint agreement on which questions were non-controversial and carried no risk of disclosure of confidential material, and which might carry such a risk. Once that was done the parties could develop a proposal regarding how to investigate whether others might have adequate information regarding the controversial questions to avoid putting the questions to Dr. Thomas. This proposal was not acceptable to Ricoh's attorneys who were willing only to discuss the mechanism for the Court to determine if Dr. Thomas has unique or superior knowledge.

PROPOSAL

Synopsys and the customer defendants believe that an appropriate next step is to determine, based on the proposed questions, whether any of the proposed questions raise sufficient risk of breaching Ricoh's privilege to require an investigation into whether the information could be obtained from some other source. The proposed questions for Dr. Thomas were crafted with the purpose of focusing on "orthodox discovery" that would avoid any areas of concern. *See* Eliasen v. Hamilton, 111 F.R.D. 396, 402 (N.D. Ill. 1986) ("no justification for barring testimony concerning facts and opinions not developed in connection with the particular case"); Atari Corp. v. Sega of America, 161 F.R.D. 417, 421 (N.D. Cal. 1994) (party to litigation may have orthodox discovery of facts and opinions held by expert serving as consultant to other side in litigation prior to the time the expert began to serve in a litigation support capacity). If the questions that cause the greatest concern can be identified, it may be possible to avoid the need for an investigation into whether Dr. Thomas has "unique or superior knowledge" on some or all of these subjects by either reformulating or withdrawing the question. If all of the areas of concern cannot be avoided by reformulating the questions, identifying those areas of concern will, nevertheless, be beneficial in that it will focus the investigation into whether Dr. Thomas has "unique or superior knowledge" on those particular questions that the Court believes pose a risk of disclosure of privileged information.

In order to identify any questions posing any risk of disclosure, Synopsys and the customer defendants invite the Court to review the proposed questions. Alternatively, the Court could instruct Ricoh to identify the questions that it believes pose a potential for the risk of inadvertent disclosure, and to explain the reasons why it believes permitting Dr. Thomas to answer the question carries a risk that some privilege will be breached.

After a subset of questions that carry some risk of disclosure is identified, the Court has suggested that an independent investigator might be retained to perform a sealed investigation into whether Dr. Thomas possesses information unique or superior to that which can be obtained from other sources, and whether those other sources are available to provide that information. Synopsys and the customer defendants believe that, in the present circumstances, this procedure is unnecessarily complicated. As a simpler alternative, the factual information available from sources other than Dr. Thomas could be identified in the ordinary course of discovery. Synopsys

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and the customer defendants have consulted with only two persons who are known to have worked with Dr. Thomas: Dr. Alice Parker and Dr. Thaddeus Kowalski. Dr. Parker and Dr. Kowalski were graduate students at Carnegie-Mellon and studied with Dr. Thomas. Synopsys and the customer defendants expect to make Dr. Parker and Dr. Kowalski available for "orthodox discovery" regarding what they know concerning the prior art, including both prior-art synthesis systems and the articles authored by Dr. Thomas. At these depositions Dr. Parker and Dr. Kowalski can be asked questions aimed at determining whether they are able to provide all of the information that Dr. Thomas may have on the subjects raised in the proposed questions.

Synopsys and the customer defendants believe that using the ordinary deposition testimony of these individuals taken in regular discovery is preferable to conducting a sealed investigation exclusively for the purpose of advising the Court on the question of whether Dr. Thomas has "unique or superior knowledge." The use of ordinary discovery will avoid the additional expenditures and procedural complications resulting from an independent investigation conducted outside the scope of ordinary discovery.

Respectfully submitted,

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June 11, 2004

VIA FACSIMILE AND U.S. MAIL

Kenneth W. Brothers
Dickstein Shapiro Morin & Oshinsky, LLP
2101 L Street NW
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Re: *Synopsys, Inc v. Ricoh Company, Ltd.*
Case No. CV 03-02289 MJJ (MCC)
Ricoh Company, Ltd. v. Aeroflex, Inc.
Case No. CV 03-04669 MJJ (MCC)

Dear Ken:

Enclosed please find a set of questions to be put to Dr. Thomas in a deposition. As suggested in the Court's Order of May 3, we have focused the inquiry exclusively on technical matters relating to prior art logic synthesis systems and the content of Dr. Thomas' prior art writings. We do not intend to ask Dr. Thomas any questions about the Kobayashi patents, or indeed any matter arising after the filing of those patents.

Very truly yours,

Matthew E. Hocker

MEH:gj
Enclosure

cc: Edward A. Meilman
Gary M. Hoffman

1. **RE: DIRECTOR, PARKER, SIEWIOREK, AND THOMAS, "A DESIGN METHODOLOGY AND COMPUTER AIDS FOR DIGITAL VLSI SYSTEMS," IEEE TRANS. ON COMPUTERS AND SYSTEMS, VOL. CAD-28, NO. 7 (JULY 1981) [DEF016252-16263].**

1.a Regarding the passage discussing Data Path Synthesis on p. 635 ("The next step in the design process is to synthesize from the behavioral description a structure in terms of physical modules which will implement the required behavior. [...] Synthesis of the data path is separated into two steps: 1) Generation of a register-transfer level structure of the data path, called the data path graph. 2) The specification of the interconnection of physical modules which implement the data path functions. The first step is referred to as data path allocation while the second step is referred to as module binding. The result of the second step is a bound path graph.").

What was the origin of the definition of synthesis contained in this passage?

Can Dr. Thomas recall or identify occasions on which this or other similar definitions of synthesis were used by persons working in the area?

What synthesis systems was Dr. Thomas aware of in the 1980s (or earlier) that implemented either of data path synthesis functions and controller synthesis functions?

What were the technical characteristics of those systems?

How did Dr. Thomas learn of those systems? Were those systems discussed at public conferences? Were those systems demonstrated? What interaction (if any) did Dr. Thomas have with the principals involved in development of those systems or other individuals who used those systems?

Did Dr. Thomas ever hear other professionals working in the field refer to the specification of the interconnection of physical modules" as "module binding.?" On what occasions and by whom?

What synthesis systems was Dr. Thomas aware of in the 1980s (or earlier) that performed module binding of either data paths or controller logic?

What were the technical characteristics of those systems?

How did Dr. Thomas learn of those systems? Were those systems discussed at public conferences? Were those systems demonstrated? What interaction (if any) did Dr. Thomas have with the principals involved in development of those systems or other individuals who used those systems?

1.b Regarding the passage on p. 635 discussing High-Level Behavioral Description ("As indicated in Fig. 1, the design process begins with a behavioral specification of the digital system to be designed. Such a specification provides a model which accurately characterizes the input-output behavior of the system without reflecting any internal structure. This level of specification might be expressed in terms of a flowchart, or as we choose to do below, in terms of a high-level hardware description language.")

Is the system illustrated in Figure 1 representative of any synthesis systems constructed at CMU?

How were the authors of the paper first introduced to the idea of using a "behavioral description" of a system as input to the design process?

Who first raised the possibility of expressing the input specification in terms of a flowchart?

What are all the types of inputs that were discussed or developed? Who was involved in the discussions? Who worked on them?

On page 637 the paper states that "We have chosen the ISP (for Instruction Set Processor) language to provide this behavioral specification." How was this decision made? What alternative inputs were considered?

1.c Regarding the discussion of a module database on p. 636 ("The output of the data path allocator is a register-transfer level description of the necessary data path. The module binding step specifies an interconnection of physical blocks contained in a module database to implement the data path logic.") and id (section under heading "C. Module Database.")

What relationship, if any, is there between a hardware library and the module database referred to in the article?

Did any of the CMU synthesis systems developed or implemented prior to 1988 include a module database or a data path allocator?

In the 1980s was Dr. Thomas aware of any other synthesis systems that included a module binding step?

What were the technical characteristics of those systems?

How did Dr. Thomas learn of those systems? Were those systems discussed at public conferences? Were those systems demonstrated? What interaction (if any) did Dr. Thomas have with the principals involved in development of those systems or other individuals who used those systems?

1.d Did Dr. Thomas discuss the concepts described in the [Director81] article with anyone prior to 1988? What are the particulars of those conversations?

2. RE: THOMAS, "THE AUTOMATIC SYNTHESIS OF DIGITAL SYSTEMS," PROCEEDINGS OF THE IEEE, VOL.69, NO.10 (OCT. 1981) [DEF076286-076298].

2.a Regarding the passage discussing "design synthesis work to be surveyed" (p. 1205):

What was the source for the information regarding the IBM logic synthesis systems discussed by Dr. Thomas at pages 1205, 1208-1209?

What exposure did Dr. Thomas have to the work done at IBM in logic synthesis in the 1980s? Did he meet with any of the principals involved in that work? On what occasions? Did he see demonstrations of any of the systems developed at IBM? Did he hear presentations regarding these systems?

What was the source for the information regarding the MIMOLA design system discussed by Dr. Thomas at pages 1205, 1206-1207?

What exposure did Dr. Thomas have to the work done in Germany on the MIMOLA logic synthesis system in the 1980s? Did he meet with any of the principals involved in that work? On what occasions? Did he see demonstrations of the MIMOLA systems? Did he hear presentations regarding these systems?

What was the source for the information regarding the ALERT and EXPL systems discussed by Dr. Thomas at pages 1205-1206?

What exposure did Dr. Thomas have to the work done in Germany on the MIMOLA logic synthesis system in the 1980s? Did he meet with any of the principals involved in that work? On what occasions? Did he see demonstrations of the MIMOLA systems? Did he hear presentations regarding these systems?

2.b Regarding the passage discussing the LSMS design aid and the D/M Allocator (p. 1208):

What individuals worked on the LSMS design aid and the D/M Allocator? What roles did each individual play? When was the work on these systems completed?

Where these two systems disclosed to persons beyond those directly involved in development of these systems? What were the circumstances of those disclosures?

Were the LSMS design aid and the D/M Allocator capable of operating together? How did they interact?

What was the particular form of the design input to the D/M Allocator? What was the form of the design input to the LSMS design aid?

2.c Regarding the passage on p. 1201 discussing division of a digital system into control and data portions ("Common to all of these levels of representation is the notion that a digital system can be divided into two major parts: control and data. [...] These types of representation within a level merely reflect the standard control and data part partitionings prevalent in the digital design process":

What was the basis for the assertion that a digital system can be divided into control and data parts?

Had Dr. Thomas discussed the fact that digital systems could be so partitioned with any other practitioners prior to preparing this article? Did he discuss this potential partitioning with others prior to 1988? What are the particulars of those discussions? Is this partitioning discussed in other references to Dr. Thomas' knowledge?

Is Dr. Thomas aware of publications from the 1980s suggesting that control and data parts of a design could be treated separately for the purposes of logic synthesis?

Is Dr. Thomas aware of any logic synthesis systems from the 1980s that treated control and data parts of a design separately during synthesis operations?

Does Dr. Thomas recall conversations in which he participated where the possibility of performing separate or discrete synthesis operations on data and control portions of a design was discussed? What are the particulars of those discussions?

the source for the information regarding the IBM logic synthesis systems discussed by Dr. Thomas at pages 1205, 1208-1209?

What exposure did Dr. Thomas have to the work done at IBM in logic synthesis in the 1980s? Did he meet with any of the principals involved in that work? On what occasions? Did he see demonstrations of any of the systems developed at IBM? Did he hear presentations regarding these systems?

3. RE: WALKER, THOMAS, "A MODEL OF DESIGN REPRESENTATION AND SYNTHESIS," PROCEEDINGS OF 22ND DESIGN AUTOMATION CONFERENCE AT PP. 453-459 [DEF017645-017651]

3.a The article discusses three different domains of design representation: behavioral, structural and physical. See, e.g., pp. 453-454, FIGS. 1-1, 2-1, and Table 2-1.

What was the origin of this distinction? Had Dr. Thomas discussed the characterization of designs in these three different domains with other practitioners in the field prior to writing this DAC presentation? Did he discuss it with individuals in the field, during the 1980s but after this DAC presentation?

Is Dr. Thomas aware of other articles or presentations that discuss the organization of design in these three different domains? What are the particulars of these treatments?

3.b The article also discusses how synthesis can be characterized as translation between different points in these three different domains. See pp. 458, FIG. 5-1.

What are the operations that are being performed in each of the arcs in Figure 5-1? In particular, what does it mean to go from "algorithms" to "register transfers" in a behavioral representation? What happens during "data path and controller allocation"? What happens during "module binding"?

The article states that "Figure 5-1 shows some examples of synthesis task in the CMU-DA [6] design methodology." What were the analogs, in the CMU-DA system, of each of the arcs shown in Figure 5-1? What modules within the system performed these functions and what were the inputs and outputs of each of these modules?

Were there other logic synthesis systems that Dr. Thomas was aware of prior to 1988 that implemented similar transitions from the Behavioral domain to the Structural domain and from the Structural domain to the Physical domain?

What were the technical characteristics of those systems? How did these systems implement the transitions between each of the three domains identified in Dr. Thomas' article?

How did Dr. Thomas learn of those systems? Were those systems discussed at public conferences? Were those systems demonstrated? What interaction (if any) did Dr. Thomas have with the principals involved in development of those systems or other individuals who used those systems?

3.c With respect to the discussion of "algorithmic level" circuit descriptions on page 456 ("This level, often called the Behavioral Level, describes the design at a level syntactically similar to programming languages. [...] Examples of Behavioral Domain components at this level are instruction decoding, effective address calculation, and instruction execution."):

Is Dr. Thomas familiar with any occasions in 1980s in which "algorithmic level" design descriptions were used as inputs, or discussed as possible inputs, to the logic synthesis process? What are the details of those uses or discussions? What logic synthesis systems, if any, developed or used during

the 1980s employed "algorithmic level" design descriptions as inputs to the logic synthesis process?

What were the technical characteristics of those systems? How did these systems implement the transitions between each of the three domains identified in Dr. Thomas' article?

How did Dr. Thomas learn of those systems? Were those systems discussed at public conferences? Were those systems demonstrated? What interaction (if any) did Dr. Thomas have with the principals involved in development of those systems or other individuals who used those systems?

Did Dr. Thomas discuss the possible use of "algorithmic level" descriptions as inputs to logic synthesis systems with other persons working in the field at any time during the 1980s? [Apart from this article.] What was the occasion and who were the participants in those discussions?

Is Dr. Thomas aware of other articles or writings from the 1980s that discuss the possible use of "algorithmic level" descriptions as inputs to logic synthesis systems? What are the details of those writings?

4. RE: HITCHCOCK & THOMAS, "A METHOD OF AUTOMATIC DATA PATH SYNTHESIS, PROCEEDINGS OF THE 20TH DESIGN AUTOMATION CONFERENCE AT PP. 484-489 [DEF075395-075400]

4.a The article refers to "register-transfer designs" and "register-transfer" description of a design. (See list of keywords and text on [DEF075395].)

What is the meaning of "register-transfer" as it is used in this article? How did the authors of this article become aware of this phrase?

Had Dr. Thomas heard other practitioners in the field refer to "register transfer" descriptions of a circuit design before this article was prepared in 1983? Where and how did Dr. Thomas hear this phrase used?

5. RE: KOWALSKI & THOMAS, "THE VLSI DESIGN AUTOMATION ASSISTANT: WHAT'S IN A KNOWLEDGE BASE," PROCEEDINGS OF THE 22ND DESIGN AUTOMATION CONFERENCE AT 252-258 [DEF022874-22880]

5.a The article refers to the Design Automation Assistant as a "knowledge-based expert system." (See first paragraph and list of keywords on [DEF022874].) The paper also refers to a "knowledge base," including a reference in the title of the paper.

How did Dr. Thomas first become aware of the phrase "knowledge-based expert system?"

How did Dr. Thomas first become aware of the phrase "knowledge base?"

On what occasions had Dr. Thomas heard these phrases before writing this 1985 paper?

5.b Which elements of the Design Automation Assistant employed a "knowledge-based expert system" and/or a "knowledge base?" What characteristics of these systems qualified them as a "knowledge-based expert system" or a "knowledge base?"

6. CARNEGIE MELLON SYNTHESIS SYSTEMS

6.a The following questions are presented with respect to each of the various logic synthesis systems developed by personnel at Carnegie-Mellon University, which include:

RT-CAD

Design Automation System (CMU-DA) (including Sugar, Logic Synthesis and Module Selection (LSMS) and Data/Memory Allocator (D/M Allocator))

System Architect's Workbench

Design Automation Assistant (DAA)

6.b Who developed these systems? What was Dr. Thomas' role in that development? During what time frame were these systems developed?

6.c Where these systems disclosed to individuals beyond those directly involved in their development? When did this disclosure take place? To whom was the disclosure made? Were any of these systems, or the components that make up the systems, demonstrated to persons beyond the development team at any point? When and to whom? Were these systems used to perform synthesis of any circuit designs?

6.d What was the form, or forms, of the design input that were processed by these systems?

What system modules were responsible for processing that input?

What was the format of the input to these modules and the output from these modules? What other parts of the system did these modules interact with?

Was the design input an "algorithmic level" description? Was it a "register transfer level" description? [See DEF017649]? Did the design input have to provide a description of the operation of the system on a clock cycle by clock cycle basis?

6.e Did these systems perform a "control step partitioning" operation? [See DEF017650, FIG. 5-1]

What system modules were responsible for performing "control step partitioning"?

What was the format of the input to these modules and the output from these modules? What other parts of the system did these modules interact with?

6.f Did these systems perform either of "data path allocation" or "controller allocation?" [See DEF017650, FIG. 5-1]

What system modules were responsible for performing these functions?

What was the format of the input to these modules and the output from these modules? What other parts of the system did these modules interact with?

6.g Did these systems perform "module binding" functions? [See DEF017650, FIG. 5-1]

What system modules were responsible for performing these functions?

What was the format of the input to these modules and the output from these modules? What other parts of the system did these modules interact with?

How was information regarding the available modules supplied to these systems? Were module libraries were used? What was the form of the information in those libraries?

6.h What types of optimizations did these systems perform?

Are optimizations performed when the systems is characterized as a collection of high-level components such as adders and multipliers? Are optimizations performed when the system is described as a collection of basic logic gates?

6.i Did these systems synthesize a control flow for the circuit?

What information, if any, about control flow was provided by the user as part of the design input? Were any optimizations performed on the control path?

Did the systems synthesize a controller for the circuit? If the user provides information relevant to the design of the controller, what is the format of that information?

6.j Did these systems synthesis a data path for the circuit?

What information, if any, about the desired data path was provided by the user as part of the design input?

6.k Did any of these systems make use of a "knowledge based expert system" or a "knowledge base?"

Which elements of these systems used a "knowledge based expert system" or a "knowledge base?" What functions of the logic synthesis system did those elements perform?

Did these system elements use "rules" to codify design knowledge? (See [DEF022878].) What portions of the logic synthesis problem were these rules designed to address?

6.l What was the form of the output from each of these systems?

Did the users and designers of the systems characterize these outputs as a netlist? On which occasions? What characteristics of these outputs made it appropriate to describe these outputs as a netlist?

If these outputs were netlists, what type of circuit structures were connected in a netlist by the logic synthesis system? Was the system capable of creating netlists of circuit modules as output? Was the system capable of creating netlists of circuit modules from technology libraries as outputs?

6.m Did the Carnegie-Mellon logic synthesis systems prior to 1988 introduce new features not found in other, earlier logic synthesis systems?

What were the most important features introduced by these systems?

What were the most significant advantages that the Carnegie Mellon systems offered over other early logic synthesis systems?

6.n Was any part of the Carnegie-Mellon logic synthesis systems ever distributed to anyone outside CMU? Who was it distributed to? When? Under what conditions? Did they pay to obtain the system? What functionality did the portion of the system distributed perform?

Was any part of the source code ever distributed? Who was it distributed to? When? Under what conditions? Did they pay to obtain the source code?

7. DR. KOBAYASHI / ICC / KBSC / RICOH

7.a Prior to this litigation, had Dr. Thomas ever heard of, or had any encounters with, any of Dr. Kobayashi, International Chip Corporation or Knowledge Based Silicon Corporation?

Was Dr. Thomas aware that one or any of these was engaged in research or development of any logic synthesis systems during the 1980s?

Details?

7.b Prior to this litigation, had Dr. Thomas ever heard of work on logic synthesis systems being done at the University of South Carolina?

Details?

7.c Prior to this litigation, had Dr. Thomas ever heard of work on logic synthesis systems being done at Ricoh Corp?

Details?

8. CONFERENCES / FIFTH GENERATION COMPUTERS

8.a What conferences did Dr. Thomas attend during the 1980s where logic synthesis work was presented or discussed? How regularly did Dr. Thomas attend such conferences?

8.b What logic synthesis systems whose development Dr. Thomas was not directly involved with, were presented or discussed at these conferences in the 1980s?

8.c Was Dr. Thomas aware of the Japanese Fifth Generation Computer Project during the 1980s? Did Dr. Thomas ever hear of a component of that research program directed to logic synthesis work?

If so, what organizations were involved in logic synthesis research connected to the Fifth Generation Computer program?

How did Dr. Thomas learn of these research programs? Were papers or presentations on this research given at any conference that Dr. Thomas attended or became aware of?

What were the technical characteristics of the systems that were developed during this research?